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REMARKS

This response is intended as a full and complete response to the Office Action dated December 15, 2004. In view of the following discussion, the Applicants believe that all claims are in allowable form.

IN THE SPECIFICATION

Paragraph [0029] of the specification stands objected to due to the misidentification of a Figure. In response, the Applicants have amended paragraph [0029] to correctly refer to Figure 2I as requested by the Examiner.

Accordingly, the Applicants respectfully request the objection be withdrawn.

CLAIM OBJECTIONS

Claim 4 stands objected to due to a grammatical error. In response, the Applicants have amended claim 4 to replace the term "comprises" with the term "comprise," as suggested by the Examiner. Claim 3 has been similarly amended.

Claim 17 stands objected to due to a typographical error. In response the Applicants have amended claim 17 to replace the term "CF₄ and CF₄" and "CF₄:CF₄" to be respectively replaced with "CF₄ and N₂" and "CF₄:N₂," as suggested by the Examiner.

Thus, the Applicants respectively submit that the above claims are now in allowable form. Accordingly, the Applicants respectfully request the objections be withdrawn and the claims allowed.

CLAIM REJECTIONS

A. 35 U.S.C. §102 Claims 1-6 and 8-10

Claims 1-6, and 8-10 stand rejected as being anticipated by United States Patent No. 6,797,633, issued September 28, 2004, to *Jiang, et al* (hereinafter *Jiang*). In response, the Applicants have amended claim 1 to more clearly recite aspects of the invention.

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Claim 1, as amended, recites limitation not taught or suggested by *Jiang*. *Jiang* describes a method for forming a dual damascene trench patterning method. However *Jiang* fails to teach or suggest etching in-situ the cap layer, a trench in the second dielectric layer, in the masking material, and the second barrier layer, by providing a plasma source power of at least 1,000 watts and a bias power of at least about 800 watts during at least a portion of step D, as recited in Claim 1.

Thus, independent claim 1, and all claims depending therefrom, are patentable over *Jiang*. Accordingly these Applicants respectfully request that the rejection be withdrawn and the claims allowed.

B. 35 U.S.C. §103 Claims 7 and 11-17

Claims 7 and 11-17 stand rejected as being unpatentable however *Jiang*, as applied to claims 1-6, 8, and 10 above, and further in view of Taiwan Patent 544815 published August 1, 2003 to *Chun, et al.* (hereinafter *Chun*), United States Patent Application Publication Serial No. 2004/0161930, published August 19, 2004 to *Ma, et al.* (herein after *Ma*), and United States Patent 6,177,147 issued on January 23, 2001 to *Samukawa, et al.* (hereinafter *Samukawa*). In response, the Applicants have amended claim 1 in order to more clearly recite aspects of the invention.

Independent claim 1, as amended, recites limitations not taught or suggested by any combination of the cited references. As discussed above, *Jiang* fails to teach or suggest etching in-situ the cap layer, a trench in the second dielectric layer, the masking material, and the second barrier layer, by providing a plasma source power of at least 1,000 watts and a bias power of at least about 800 watts during at least a portion of step D, as recited in claim 1.

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Chun discloses a process for etching a nitride layer and an oxide layer using O₂, N₂, and CF₄ in a ratio of O₂:N₂:CF₄ equal to 4-50:0-10:1. *Chun* further discloses applying an RF power in the range of 100 to 1000 Watts and is silent regarding bias power. (*Chun*, Abstract.) However, *Chun* fails to teach or suggest modifying *Jiang* in a manner that yields a method including the steps of etching in-situ the cap layer, a trench in the second dielectric layer, the masking material, and the second barrier layer, by providing a plasma source power of at least 1,000 watts and a biased power of at least about 800 watts during at least a portion of step D, as recited in claim 1.

Ma discloses a method of in-situ discharge prior to a plasma etch in order to avoid arcing within the chamber during the plasma etch process. (*Ma*, paragraph [0001].) *Ma* further discloses applying an RF power in the range of 100 to 1000 Watts for a 200 mm wafer and from 100 to 2000 Watts for a 300 mm wafer. *Ma* is silent regarding bias power. (*Ma*, paragraph [0028].) However, *Ma* fails to teach or suggest modifying *Jiang*, alone or as modified by *Chun*, in a manner that yields a method including the steps of etching in-situ the cap layer, a trench in the second dielectric layer, the masking material, and the second barrier layer, by providing a plasma source power of at least 1,000 watts and a bias power of at least about 800 watts during at least a portion of step D, as recited in claim 1.

In addition, although the Examiner contends that it would have been obvious to modify the etch steps of *Jiang* using the power, pressure, and flow rates as taught by the discharge sequence of *Ma* in order to avoid arcing during the plasma etch processes, *Ma* discloses that the discharge sequence is performed prior to the plasma etch process. (*Ma*, paragraph [0014]). Moreover, *Ma* states that no etching of the photoresist layer or substrate occurs during the discharge sequence. (*Ma*, paragraph [0028]). Therefore, any combination of the teachings of *Ma* and *Jiang* would result in performing a discharge step (that does not etch the substrate) prior to plasma etching in order to avoid arcing. As such, there is no suggestion to modify the etch steps of *Jiang* with the process

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conditions of the discharge sequence taught by *Ma*, as asserted by the Examiner.

Samukawa discloses a process and apparatus for treating a substrate using an ultra-high frequency (UHF) plasma. *Samukawa* further generally discloses applying a UHF RF power in the range of 0 to 1000 Watts and is silent regarding bias power. (*Samukawa*, Figs 3, 6-8, and accompanying text.) However, *Samukawa* fails to teach or suggest modifying any combination of *Jiang*, *Chun*, and *Ma* in a manner that yields a method including the steps of etching in-situ the cap layer, a trench in the second dielectric layer, the masking material, and the second barrier layer, by providing a plasma source power of at least 1,000 watts and a bias power of at least about 800 watts during at least a portion of step D, as recited in claim 1.

Thus, independent claim 1, and all claims depending there from, are patentable over *Jiang* in view of *Chun*, *Ma*, and *Samukawa*. Accordingly, the Applicants respectfully request that the rejection be withdrawn and the claims allowed.

NEW CLAIMS

New claims 40 through 46 have been added to the application. Applicants respectfully submit that no new matter has been added and the claims are patentable over the cited art and should be allowed. In particular, the cited art fails to teach or suggest a method of etching a dielectric layer including the steps of supplying a source power of at least about 1000 Watts at a frequency of above about 100 MHz to a plasma source electrode and a bias power of at least about 800 Watts to a substrate bias electrode, as recited in independent claim 40.

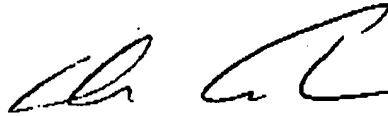
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CONCLUSION

Thus, the Applicants submit that all claims now pending are in condition for allowance. Accordingly, both reconsideration of this application and its swift passage to issuance are earnestly solicited.

If, however, the Examiner believes that any unresolved issues still exist, it is requested that the Examiner telephone Mr. Keith Taboada at (732) 530-9404 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully submitted,



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